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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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YAO-4340US

2344

7590

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EXAMINER

CAO, ALLEN T

ART UNIT

PAPER NUMBER

2652

10

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/787,480

Applicant(s)

YOKOYAMA ET AL.

Examiner

Allen T Cao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-93 is/are pending in the application.
- 4a) Of the above claim(s) 70-93 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17, 21-27, 30-32, 38-40, 45, 46, 48-50, 53-58 and 64-69 is/are rejected.
- 7) ☒ Claim(s) 18-20, 28, 29, 33-37, 41-44, 47, 51, 52 and 59-63 is/are objected to.
- 8) ☒ Claim(s) 1-93 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5-7.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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1. Claims 70-93 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected claims, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 9.
2. Applicant's election without traverse of Group I, claims 1-69, in Paper No. 9 is acknowledged.
3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The term "means" in the abstract, lines 3, 4 and 5 should be avoided.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-17, 21-27, 30-32, 38-40, 44-45, 48-50, 53-58 and 64-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over either JP9265738 or Murphy (US. 6,515,834 B1) in view of Blessom et al (US. 4,374,402).

JP ('738) discloses a head support mechanism (actuator mechanism including the suspension 3) comprising a head 1 and a slider 2 for carrying the head, the head being caused to track by main driving means (voice coil motor, actuator mechanism, suspension, etc...), wherein the head support mechanism further comprises driving sub-means (7 including 7a and 7b) and causing the head to have a micro-movement; and the driving sub-means causes the head to have a micro-movement by utilizing flexural deformation of the driving sub-means as set forth in claims 1 and 7.

Murphy discloses a head support mechanism (actuator mechanism 14 including the suspension mechanism 34) comprising a transducer head carried by a slider 20, the head being caused to track by main driving means (voice coil motor, actuator mechanism, suspension, etc...), wherein the head support mechanism further comprises driving sub-means (32a and 32b) and causing the head to have a micro-movement; and the driving sub-means causes the head to have a micro-movement by utilizing flexural deformation of the driving sub-means as set forth in claim 1.

Neither JP ('738) nor Murphy discloses that the sub-means comprising a thin film as recited in claim 1.

Blessom et al disclose a head support mechanism comprising driving sub-means (33 and 35) and causing the head to have a micro-movement; wherein the driving sub-means comprises a thin film (column 9, lines 59-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sub-means of the head support mechanism of either JP ('738) or Murphy with a thin film as taught by Murphy et al.

The rationale is as follows: One of ordinary skill in the art would have been motivated to modify the sub-means of the head support mechanism of either JP ('738) or Murphy with a thin film as taught by Murphy et al as an obvious replace parts which has same result that causes the head to have a micro movement and in order to reduce the thickness of the head support mechanism.

Regarding claims 6 and 22-23, either Murphy or JP ('738) inherently discloses that the head support mechanism includes a plurality of plate spring portions disposed in a radial arrangement from a rotation center and the driving sub-means is formed on the plurality plate spring portions; each of the sub-means is causing the head to have a micro-movement as set forth, supra.

Regarding claim 10, JP ('738) or Murphy as modified by Blessom et al inherently disclose that the main portion of a member comprised by the driving sub-means is disposed "in a space within the thickness, from the disk surface, of the slider along a height direction".

Regarding claims 11 and 30, JP ('738) or Murphy as modified by Blessom et al inherently disclose that the driving sub-means is in the "vicinity" of a position along a height direction from the disk surface of a center of gravity of the slider. Regarding claim 30, JP ('738) or Murphy as modified by Blessom et al inherently disclose a first member (flexure, suspension) coupled to the slider; and a second member (actuator arm) coupled to the main driving means (voice coil motor, rotor); wherein the driving sub-means is formed on the first member.

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Regarding claims 12, 25 and 50, JP ('738) or Murphy as modified by Blessom et al disclose that the head support mechanism includes a plurality of plate spring portions formed substantially perpendicular to the disk surface/tracking direction.

Regarding claims 13 and 48, JP ('738) or Murphy as modified by Blessom et al inherently disclose that the driving sub-means further comprises a base material to function as an actuating plate and the base material comprises a spring material.

Regarding claims 14 and 15, JP ('738) and Murphy and Blessom et al disclose that the driving sub-means is of a piezoelectric type.

Regarding claims 16 and 17, JP ('738) or Murphy as modified by Blessom et al disclose a first member (flexure, suspension) coupled to the slider; and a second member (actuator arm) coupled to the main driving means (voice coil motor, rotor); wherein the driving sub-means is formed on the first member (claim 16), a bend portion (claim 17).

Regarding claim 21, JP ('738) or Murphy as modified by Blessom et al inherently disclose that a recording/reproducing signal wiring coupled to the head is formed on the driving sub-means formation member (piezoelectric characteristics).

Regarding claim 26, either JP ('738) or Murphy as modified by Blessom et al disclose that the head support mechanism comprises a pair of driving sub-means.

Regarding claim 27, either JP ('738) or Murphy as modified by Blessom et al disclose that the driving sub-means is located so as to be substantially parallel to a direction in which the slider is disposed.

Regarding claim 31, either JP ('738) or Murphy as modified by Blessom et al disclose that the head support mechanism comprises two or more pairs of driving sub-means (each suspension contains a pair of the sub-means).

Regarding claim 38, either JP ('738) or Murphy as modified by Blessom et al inherently disclose that the information recording/reproducing apparatus (disk drive) further comprises control means (flexible circuit) for controlling the main driving means and the driving sub-means.

Regarding claims 2-3, 8-9, 24 and 49, either JP ('738) or Murphy as modified by Blessom et al disclose that the thin film has a thickness equal or less than  $10\mu\text{m}$  (claims 2-3 and 9), or the thickness direction substantially coincides with a tracking direction of the head (claim 8).

Regarding claim 68, either JP ('738) or Murphy as modified by Blessom et al inherently disclose that the base material includes wiring for applying a voltage to the thin film (flexible circuit is a wiring circuit and which is applied a voltage/current to the parts of the actuator mechanism).

Regarding claim 69, either JP ('738) or Murphy as modified by Blessom et al inherently disclose that the wiring is formed after the thin film is formed on the base material.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the thin film (sub-means) of either JP ('738) or Murphy as modified by Blessom et al with a thickness of equal or less than  $10\mu\text{m}$  (claims 2-3 and 9), or the thickness direction substantially coincides with a tracking

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direction of the head (claim 8) through an obvious engineering reducing thickness in order to reduce the thickness of the head support mechanism, thus provide a more compact disk drive.

JP ('738) discloses that the sub-means (7a, 7b) is made by a batch process. However, either JP ('738) or Murphy as modified by Blessom et al do not disclose that the thin film (sub-means) is made through a film growth process (claims 3 and 39) or a direct film growth process (claims 4 and 40) or a transcription process (claims 5 and 46), or a semiconductor process (claim 32), or a vacuum process (claim 45), or rf sputtering method (claim 55). Either JP ('738) or Murphy as modified by Blessom et al do not disclose that the base material is formed of stainless steel (claim 53), or silicon (claim 54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the thin film of the sub-means of either JP ('738) or Murphy as modified by Blessom et al with through either a film growth process (claims 3 and 39) or a direct film growth process (claims 4 and 40) or a transcription process (claims 5 and 46), or a semiconductor process (claim 32) or a vacuum process (claim 45), or rf sputtering method (claim 55); the base material is formed of stainless steel (claim 53), or silicon (claim 54) through an obvious different processes in order to improve the deformable characteristics of the sub-means, thus to improve the micro-movement of the head. Additionally it is not found to be persuasive as a process limitation should only be accorded weight to the extent that it affects the structure of the completed thin film of the sub-means of the head support mechanism since claims are



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directed to a "head support mechanism", per se. Furthermore, it should be noted that "[d]etermination of patentability in 'product-by-process' claims is based on product itself, even though such claims are limited and defined by process, and thus product in such claim is unpatentable if it is the same as, or obvious form, product of prior art, even if prior art product was made by a different process", In re Thorpe, et al., 227 USPQ 964 (CAFC 1985). It should also be noted that a "[p]roduct-by process claim, although reciting subject matter of claim in terms of how it is made, is still product claim; it is patentability of product claimed and not recited process steps that must be established, in spite of fact that claim may recite only process limitations", In re Hirao and Sato, 190 USPQ 685 (CCPA 1976).

Regarding claims 56-58, JP ('378) or Murphy as modified by Blessom et al do not disclose that the thin film piezoelectric comprises a PZT film (claim 56), or ZnO film (claim 57), or PVDF film (claim 58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the thin film piezoelectric of JP ('378) or Murphy as modified by Blessom et al with a PZT film (claim 56), or ZnO film (claim 57), or PVDF film (claim 58).

The rationale is as follows: One of ordinary skill in the art would have been motivated to make the thin film piezoelectric of JP ('378) or Murphy as modified by Blessom et al with a PZT film (claim 56), or ZnO film (claim 57), or PVDF film (claim 58) as an obvious chosen between well known chemical materials. Additionally, it has been held to be within the general skill of a worker in the art to select a known material having

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different chemical bonding structures on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416 (CCPA 1960).

Regarding claims 64-67, JP ('378) or Murphy as modified by Blessom et al do not disclose that the under layer comprises a PT layer (claim 65), or PT layer contains substantially no Zr (claim 66), or the metal film comprises of a platinum film (claim 67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the under layer comprises a PT layer (claim 65), or PT layer contains substantially no Zr (claim 66), or the metal film comprises of a platinum film (claim 67).

The rationale is as follows: One of ordinary skill in the art would have been motivated to make the thin film piezoelectric of JP ('378) or Murphy as modified by Blessom et al with a PT layer (claim 65), or PT layer contains substantially no Zr (claim 66), or the metal film comprises of a platinum film (claim 67) as an obvious chosen between well known chemical materials. Additionally, it has been held to be within the general skill of a worker in the art to select a known material having different chemical bonding structures on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416 (CCPA 1960).

6. Claims 18-20, 28-29, 33-37, 41-44, 47, 51-52, and 59-63 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US006421211B1, US006512659B1, US006542337B2, US006541931B2, US006535360B1, US005801906.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen T Cao whose telephone number is (703) 305-3796. The examiner can normally be reached on Mon - Thurs (7:30 - 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen Cao  
Primary Examiner

AC  
April 27, 2004